

normal; the highest was 96°, at Fort Spokane on the 17th and at Lind on the 18th, and the lowest, 24°, at Hunters on the 28th. The average precipitation was 2.78, or about 0.75 above normal; the greatest monthly amount, 7.65, occurred at Cedar Lake, and the least, 0.05, at Kennewick.—*G. N. Salisbury.*

*West Virginia.*—The mean temperature was 67.6°; or about 2.5° above normal; the highest was 97°, at New Cumberland on the 1st, and the lowest, 33°, at Uppertract on the 11th. The average precipitation was 2.42, or about 0.65 below normal; the greatest monthly amount, 4.75, occurred at Huntington, and the least, 0.80, at Green Sulphur Springs.—*C. M. Strong.*

*Wisconsin.*—The mean temperature was 62.4°, or 1.4° above normal; the highest was 99°, at Medford and Spooner on the 2d, and the lowest, 23°, at Barron and Knapp on the 10th. The average precipitation was 2.00, or 0.95 below normal; the greatest monthly amount, 3.70, occurred at Koepenick, and the least, 0.51, at Pekin.—*W. M. Wilson.*

*Wyoming.*—The mean temperature was 54.2°, or 3.1° below normal; the highest was 100°, at Bittercreek on the 19th, and the lowest, 8°, at Atlantic City on the 28th. The average precipitation was 0.25, or 0.74 below normal; the greatest monthly amount, 0.90, occurred at Fort Yellowstone, while none fell at Bittercreek, Carbon, and Labarge.—*W. S. Palmer.*

## SPECIAL CONTRIBUTIONS.

## THE PROBABLE STATE OF THE SKY ALONG THE PATH OF TOTAL ECLIPSE OF THE SUN, MAY 28, 1900.

Second report, observations of 1898, by Prof. FRANK H. BIGELOW.

In the MONTHLY WEATHER REVIEW for September, 1897, was published the first report of the observations taken under the direction of the United States Weather Bureau, in order to determine the probable meteorological conditions likely to prevail along the path of the total eclipse of the sun, which will occur in the Southern States, on May 28, 1900. The present report is the second of the series and contains the result of the survey of the sky along the path, for the period beginning May 15 and ending June 15, 1898; it will be followed by a third in 1899. The observations have been conducted during 1898 on precisely the same plan as in the preceding year, and generally by the same observers, so that the correctness of the numbers herein given is fortified by longer experience than was the case in 1897. Moreover 87 stations reported this year, as against 62 stations last year.

The scale of the observations is as follows: For the *general state of the sky*, 0 = sky entirely clear; 1 = sky  $\frac{1}{2}$  cloudy; 2 = sky  $\frac{3}{4}$  cloudy; 3 = sky  $\frac{3}{4}$  cloudy; 4 = sky entirely overcast. For the *sky near the sun*, 0 = sun clear from clouds; 1 = sun in scattered clouds; 2 = sun in a mass of clouds; 3 = sun quite invisible. Hence the sums of the numbers recorded indicate the total observed cloudiness. Since, under general state of the sky, this might have been equal to 12 for each day, the total possible cloudiness would be 384 for the given 32 days; and for the sky near the sun the sum might be 9 for each day, and 288 for 32 days. Hence, dividing the totals at any station by these numbers, we have its percentage; or, dividing the mean for all the stations within a State by these numbers, we have the percentage for that State.

TABLE 1.

Stations.	Observers.	General state of the sky, a. m.				Sky near the sun, a. m.			
		8:00	8:30	9:00	Sum.	8:00	8:30	9:00	Sum.
<i>Virginia.</i>									
Onancock.....	J. C. Weaver.....	58	54	57	169	41	38	39	118
Birdsneet.....	C. R. Moore.....	76	72	72	220	55	44	46	145
Hampton Institute..	C. L. Goodrich.....	64	64	63	191	39	39	36	114
Cape Henry.....	C. P. Cronk.....	66	68	70	204	46	52	50	148
Norfolk.....	James J. Gray.....	62	57	56	175	45	42	41	128
Indlake.....	J. O. Branch.....	38	34	33	105	20	19	20	59
Wallacetown <sup>1</sup> .....	Jno. G. Wallace.....	59	49	59	177	43	40	43	126
Means.....					177				120
Per cent of total	possible cloudiness..				44.9				41.7
<i>North Carolina.</i>									
Willeyton.....	H. B. Cross.....	51	49	46	146	35	32	27	94
Gatesville.....	J. T. Walton.....	44	43	33	120	30	29	23	82
Winton <sup>2</sup> .....	S. S. Daniel.....	30	20	19	59	17	17	16	50
Scotland Neck.....	W. L. Howell.....	39	40	39	118	35	36	32	103
Weldon.....	T. A. Clark.....	57	61	53	171	39	42	36	117
Nashville.....	J. B. Boddie.....	86	72	62	220	57	51	47	155
Rocky mount.....	Gaston Battle.....	56	54	55	165	44	42	39	125
Springhope.....	Geo. W. Bunn.....	48	48	44	140	34	31	31	96
Wilson.....	W. S. Harriss.....	26	26	26	78	15	16	16	47
Louisburg.....	Thomas B. Wilder.....	29	29	26	84	14	16	14	44
Auburn.....	Troy Poole.....	37	35	36	108	26	23	23	72
Selma.....	R. J. Noble.....	23	18	21	63	18	15	17	50
Raleigh.....	C. F. von Herrmann.....	59	58	53	170	40	37	36	113

TABLE 1—Continued.

Stations.	Observers.	General state of the sky, a. m.				Sky near the sun, a. m.			
		8:00	8:30	9:00	Sum	3:00	8:30	9:00	Sum
<i>North Carolina—Con.</i>									
Pittsboro.....	A. H. Merritt.....	48	39	36	123	36	31	25	92
Moncure.....	W. H. Thompson.....	38	34	30	102	28	24	21	73
Albemarle.....	G. M. Dry.....	32	32	32	96	17	16	16	49
Fayetteville.....	Frank Glover.....	36	37	34	108	23	25	24	72
Laurinburg.....	L. D. McKinnon.....	24	27	21	72	21	21	16	58
Rockingham.....	J. M. Stansill.....	41	33	24	98	14	7	4	25
Wadesboro.....	W. K. Boggan.....	13	10	6	29	10	5	3	18
Monroe.....	T. A. Ashcroft.....	23	17	14	54	14	8	6	28
Means.....					111				74
Per cent of total	possible cloudiness..				28.2				25.7
<i>South Carolina.</i>									
Cheraw.....	James H. Powe.....	36	34	31	101	24	22	22	68
Lancaster.....	J. C. Foster.....	32	32	31	95	16	17	14	47
Lewis.....	S. M. Burdell.....	16	19	20	55	14	18	22	54
Santuck.....	E. W. Jeter.....	21	16	14	51	13	15	8	36
Columbia.....	J. W. Bauer.....	34	29	28	91	22	24	21	67
Little Mountain.....	Jno. M. Lease.....	38	36	26	100	25	19	15	59
Prosperity (near).....	J. Perry Cook.....	19	18	17	54	16	14	11	41
Chappels.....	Samuel R. Keith.....	28	23	18	69	19	10	12	41
Longshore.....	W. G. Peterson.....	33	28	22	83	19	12	6	37
Crosshill.....	E. T. McSwain.....	19	20	18	57	17	17	16	50
Saluda.....	Ernest L. Mathers.....	31	28	23	82	20	17	14	51
Greenwood.....	M. M. Calhoun.....	11	15	15	41	8	9	10	27
Trenton.....	C. A. Long.....	10	9	5	24	7	5	3	15
Troy.....	A. C. Kennedy.....	43	43	39	125	27	21	17	65
Hodges.....	W. K. Carlisle.....	22	22	15	59	15	17	8	40
Watts.....	Dr. J. W. Thomas.....	24	21	17	62	20	16	11	47
Mount Carmel.....	Jno. D. Cade.....	5	9	15	29	7	11	20	38
Means.....					69				46
Per cent of total	possible cloudiness..				17.5				16.0
<i>Georgia.</i>									
Camak.....	J. A. Chapman.....	16	11	8	35	12	8	1	21
Crawfordville.....	J. P. Moody.....	26	24	21	71	6	6	5	17
Athens.....	C. D. Cox.....	21	18	16	55	14	8	4	26
Covington.....	J. S. Carroll.....	7	8	9	24	18	18	21	57
Atlanta.....	P. McDonough.....	28	28	24	80	21	19	18	58
Griffin.....	H. P. Hardin.....	12	12	16	40	6	8	10	24
Macon.....	E. Lovelace.....	8	10	9	27	6	10	8	24
Talbotton.....	A. G. Goodloe.....	10	10	9	29	7	7	8	22
Westpoint.....	Wm. T. Dennis.....	22	22	21	65	7	7	8	22
Columbus.....	T. J. Jennings.....	10	7	4	21	5	3	2	10
	Josephine W. Long.....	33	17	14	64	23	16	11	50
Means.....					48				31
Per cent of total	possible cloudiness..				12.2				10.8
<i>Alabama.</i>									
Smiths Station.....	A. H. Frazer.....	18	17	18	53	15	17	11	43
Fort Mitchell.....	John Caney.....	32	28	27	87	20	20	20	60
Auburn.....	James T. Anderson.....	26	22	19	67	21	15	17	53
Loachapoka.....	W. W. David.....	25	24	23	72	11	14	11	36
Tallapoosa.....	J. T. Jarman.....	29	29	25	83	24	21	17	62
Union Springs.....	P. L. Cowan.....	17	20	20	57	18	21	21	60
Mathews.....	W. D. Dillard.....	16	15	14	45	10	12	12	34
Montgomery.....	I. Gwynn Gardiner.....	39	16	7	62	33	13	5	51
Highland Home.....	Samuel Jordan.....	20	18	16	54	11	5	2	18
Fort Deposit.....	J. F. Haltemir.....	18	14	8	40	9	6	5	20
Greenville.....	F. E. Dey.....	17	13	5	35	9	5	0	14
Pineapple.....	J. S. Crum.....	30	42	33	105	38	40	25	103
Castleberry.....	S. Castleberry.....	17	13	12	42	18	11	11	40
Bay Minette.....	Mrs. M. J. Washburn.....	18	19	21	58	16	21	25	62
Latham.....	M. McGowan.....	16	16	16	48	6	6	4	16
Mobile.....	W. M. Dudley.....	35	33	31	99	10	12	13	35
	Herbert E. Vail.....								
Mount Vernon.....	C. Becker.....	48	45	42	135	29	30	25	84
Citronelle.....	J. G. Michael.....	19	19	21	59	12	5	10	27
Means.....					67				48
Per cent of total	possible cloudiness..				17.1				15.7
<i>Mississippi.</i>									
Leakesville.....	Samuel Pool.....	14	17	15	46	15	13	19	47
Americus.....	E. Davis.....	37	39	44	120	55	54	56	165
Ocean Springs.....	Harley F. Halstead.....	6	10	8	24	4	8	6	18
Biloxi.....	James J. Lemon.....	36	37	41	114	22	24	25	71
Bay St. Louis.....	Brother Isidore.....	44	42	40	126	24	22	21	67

TABLE 1.—Continued.

Stations.	Observers.	General state of the sky, a. m.				Sky near the sun, a. m.			
		8:00	8:30	9:00	Sum.	8:00	8:30	9:00	Sum.
Mississippi—Con'd.									
Pearlington.....	Annette Koch.....	39	39	37	115	30	28	28	86
Means.....total					91				76
Per cent of total	possible cloudiness.....				23.0				26.4
Louisiana.									
Poydras.....	P. V. Relimpio.....	42	45	46	133	16	16	22	54
New Orleans.....	H. F. Alciatore.....	59	61	67	187	27	29	33	89
Southern Uni'y Farm.....	Hugh Jamieson.....	41	45	41	127	27	29	24	80
Houma.....	Mrs. K. M. Haggerty.....	39 <sup>3</sup>	49 <sup>3</sup>	53 <sup>3</sup>	141	29	28	29 <sup>3</sup>	86
Napoleonville.....	Edward Godchaud.....	57	48	39 <sup>3</sup>	144	38	28	23	89
Paincourtville.....	Jos. E. LeBlanc.....	25	38	46	109	21	33	38	92
Franklin.....	J. M. Bonney.....	51	54	58	163	40	52	37	129
Means.....total					143				80
Per cent of total	possible cloudiness.....				36.4				30.9

<sup>1</sup>Three days missing.<sup>2</sup>Four days missing.<sup>3</sup>One day missing.

In Table 1 are given the States, the stations, the observers, the sums of the daily numbers at each station, deduced from the observations at 8:00, 8:30, and at 9:00 each morning, both for the entire sky and for the sky near the sun respectively; also the sum for the three sets in each group, the mean for each state, and finally the percentage. Collecting these last together in Table 2 the result is presented compactly. It may be compared with the corresponding result for 1897, which is copied from the first report, and placed in the lower section of the table.

TABLE 2.—Percentage of cloudiness, by States.

YEAR OF OBSERVATION, 1898.

Name of State.	General sky.	Near the sun.	Name of State.	General sky.	Near the sun.
Virginia.....	44.9	41.7	Alabama.....	17.1	15.7
North Carolina.....	28.2	25.7	Mississippi.....	23.0	26.4
South Carolina.....	17.5	16.0	Louisiana.....	36.4	30.9
Georgia.....	12.2	10.8			

YEAR OF OBSERVATION, 1897.

Virginia.....	49.2	42.7	Alabama.....	15.2	14.9
North Carolina.....	35.8	33.3	Mississippi.....		
South Carolina.....	33.7	32.1	Louisiana.....	26.5	21.5
Georgia.....	18.4	16.0			

Chart IX, at the end of the WEATHER REVIEW for this month is constructed in the same manner as that for last year, and gives under the name of each station the two observation sums, (1) for the general sky, and (2) for the sky near the sun. This will enable the reader to consider the local conditions more closely. The original observation sheets contain notes describing the weather of each day at the several stations. An inspection of Table 2 indicates that the observations of 1898 give *precisely the same result* as those of 1897, which is as follows: *The weather conditions in the interior of Georgia and Alabama were better than in Virginia, North Carolina, South Carolina, Mississippi, and Louisiana; and judging from this table it would be much safer for the eclipse expeditions to locate their stations in the northern portions of Georgia and Alabama, upon the southern end of the Appalachian Mountains, where the track crosses the elevated areas, than nearer the coast line in either direction northeastward toward the Atlantic coast, or southwestward toward the Gulf coast; on the coast itself the weather is more unfavorable than in any other portion of the track.*

In 1898 the weather was decidedly better along the Georgia portion of the track, somewhat better near the Atlantic coast, but worse nearer the Gulf coast than in 1897. In both years the percentage of cloudiness was three times greater near the coast than in the Georgia and Alabama portions of the track.

These observations will be continued in the year 1897.

## ELECTRIC SIGNAL APPARATUS AT ATLANTIC CITY, N. J.

By AL. BRAND, Observer Weather Bureau (dated October 13, 1898).<sup>1</sup>

I have the honor to inclose herewith a drawing and description of the electrical signal apparatus recently installed at the Weather Bureau station in Atlantic City. The support, as built, was devised by myself, with the help of several valuable suggestions offered by Mr. Hudson S. Vaughan, architect, and by making use of the lowering feature of the old Maring anemometer support.

Having been informed that the usual method at stations using electric lights for signals is to have the regulation lanterns attached to the flag pole, therefore I am inclined to believe that my support has nothing in common with those in use at other stations.

The suggestion of the Central Office in regard to pilot lamps was adopted, and I have had these lamps placed directly on the switch board, which is in a convenient position above the observer's desk.

## DESCRIPTION OF WORK AND MATERIALS.

## Support.

The fixed or lower portion of the support (see Chart VIII, Fig. 1) is built up of well-seasoned yellow pine in the shape of a sheath, or channel, the dimensions of which are as follows: The two side pieces are 14 feet and 9 inches long and 3 inches by 5 inches at the top, gradually diminishing to 3 inches by 6 inches at the base. The centerpiece, which extends from within about 1 foot of the top to the base, is 2½ inches thick and of a sufficient depth to fill out the remaining space on one side of the pipe when the latter is in a perpendicular position. From about 6 inches below the pipe to the bottom of the support the centerpiece is built out flush with the sides. The three pieces of the support are securely bolted together with ½-inch iron bolts. The support rests on a piece of timber 3 inches thick by 10 inches wide and 2 feet long, and is bolted to the chimney with three ½-inch iron bolts. The metal portion of the support is built up of two lengths of galvanized-steel pipe, the upper portion of which is 18 feet long and 1½ inch in diameter on the outside, the lower portion being 20 feet long and 2½ inches in diameter on the outside. The smaller pipe is made to pass into the larger for a distance of about 3 feet, and made thoroughly rigid at that point with molten metal. Steel elbow and "T" fittings, short pieces of pipe and hooks, are used in making the short horizontal arms on which the lamps are hung, and which are fastened to the tops of both the larger and smaller pipe, as shown in drawing. The centers of the hooks, on which the lamps swing, are at a distance of just one-half of the diameter of the bottom of a lamp from the side of the upright pipe. This insures the lamps swinging plumb, and at the same time snugly against the pipe, thus relieving the latter from all unnecessary strain. The steel pipe swings at a point within 6 inches of the top of the wooden support, on a ½-inch hardened steel pin, which passes through the larger portion of the pipe at a point 9 feet below the bottom horizontal arm, washing in two ½-inch iron plates 6 by 6 inches square. Pin has head and nut washers.

The pipe being swung into a perpendicular position (which causes all of that portion of the pipe below the pivot pin to enter into the channel) it is securely locked in place by a 5/16-inch steel pin near the base.

A block of 2½ inches wide and about 6 inches long, and of a sufficient depth so as to fill out the remaining space on the

<sup>1</sup>Having seen a newspaper paragraph commendatory of the special devices in use at Atlantic City by the Weather Bureau observer, in connection with his electric signals, the Editor has requested Mr. Brand to publish some account of these in the MONTHLY WEATHER REVIEW, so that others may profit by his experience.—ED.



Chart IX. Cloudiness During the Total Eclipse of 1900.

